

WHAT IS CLAIMED IS:

Sub B1  
1. A charge transfer semiconductor device including a crystalline semiconductor film having rod-like or columnar crystals extending in a predetermined direction, said device comprising:

5 a charge storing means including a plurality of photodetecting elements, said photodetecting elements being for storing a charge in accordance with an incident light; and

a charge transfer means for transferring said charge stored in said charge stored means,

10 wherein said predetermined direction coincides or approximately coincides with a charge transfer direction of the charge transfer means.

2. A charge transfer semiconductor device including a crystalline semiconductor film having rod-like or columnar crystals extending in a predetermined direction, said device comprising:

15 a charge coupled device,

wherein said predetermined direction coincides or approximately coincides with a charge transfer direction of the charge coupled device.

3. A device according to claim 1 wherein the crystalline semiconductor film is formed on a quartz substrate and said incident light is made from a side of the quartz substrate.  
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4. A device according to claim 1 wherein said charge transfer direction includes a plurality of directions.

Sub B2  
5. A device according to claim 1 further comprising an active matrix display device being integrated with said charge transfer means on the same substrate.

25 6. A device according to claim 2 further comprising an active matrix display device being integrated with said charge coupled device on the same substrate.

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C-102  
7. A method of manufacturing a charge transfer semiconductor device including a crystalline semiconductor film having rod-like or columnar crystals extending in a predetermined direction, said method comprising the steps of:

forming an amorphous semiconductor film on an insulating surface;

5 selectively introducing a metal element for promoting crystallization of said semiconductor in contact with a predetermined region of said amorphous semiconductor film;

heating to grow crystals in parallel with said insulating surface from said predetermined portion whereby said crystalline semiconductor film is formed;

10 heating said crystalline semiconductor film in an oxidizing atmosphere including a halogen element to form a thermal oxidation film on a surface of the semiconductor film;

removing said thermal oxidation film; and

15 forming a charge coupled device for transferring a charge in a direction that coincides or approximately coincides with said predetermined direction.

8. A method according to claim 7 wherein said insulating surface is a quartz substrate;

9. A method according to claim 7 wherein said metal element is at least one element selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, and  
20 Au.

10. A method according to claim 7 wherein said crystalline semiconductor film is heated in the oxidizing atmosphere at 800-1100°C.

11. A device according to claim 2 wherein the crystalline semiconductor film is formed on a quartz substrate and an incident light is made from a side of the quartz  
25 substrate.

12. A device according to claim 2 wherein said charge transfer direction

includes a plurality of directions.

~~13. A device according to claim 1 wherein said semiconductor film is a silicon film.~~

14. A device according to claim 2 wherein said semiconductor film is a silicon  
5 film.

15. A method according to claim 7 wherein said semiconductor film is a silicon  
film.

Add  
A1 7

Add  
E2 7

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